

I do it better: How social and emotional learning environment enhances Assessment for Learning strategies in science classrooms

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ABSTRACT

This paper describes part of a larger national scale study on Malaysian teachers' classroom practices in terms of pedagogical, curriculum implementation and assessment. The original study involved 153 Year 7 teachers from 24 randomly selected schools. The data was obtained from a questionnaire and video recordings of three lessons for each teacher. In the context of teachers' classroom assessment practices, the data was analysed using a self-developed Assessment for Learning (AfL) rubric that contained four-level performance rating. The findings of teachers' AfL practices revealed that a large majority of teachers' practices were at the lowest level and were deemed unsatisfactory. The present study was inspired by these findings. The present study used a qualitative approach where two teachers were purposely selected based on their AfL practices. The study investigated how these teachers created (if any) social and emotional learning environments and to see how these environments affected the AfL strategies the teachers implemented. Using the video recordings of the three lessons and transcribing the classroom discourses, the data was analysed by identifying 'episodes' that focused on student-teacher interactions during the implementation of AfL strategies. Our findings revealed that one teacher was able to create a more social and emotional learning environment and this led to active participation of her students and them taking responsibility for their own learning. The research findings may have implications on how teacher education and teacher development programmes could incorporate elements of how to create social and emotional learning environments to improve teachers' AfL skills.

KEYWORDS

Assessment for Learning, Social and emotional learning, Science teachers

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INTRODUCTION

Research on Assessment for Learning (AfL) has consistently shown positive educational outcomes for all grade levels, for a broad spectrum of subjects and for various educational setting (Andrade & Cizek, 2010; Black & Wiliam, 1998; Hattie & Timperley, 2007). Teachers who practice AfL strategies in their classrooms would ensure that their students are actively involved in taking stock of where they are currently in their learning; are well informed of what they should aspire to achieve; and are insightful of what actions that need to be taken to move their current learning status to the desirable learning goals (ARG, 2002; Heritage, 2010). Some of the AfL strategies that teachers can incorporate into their daily work include sharing learning targets, discussing success criteria, developing high quality assessment tasks, providing constructive and meaningful feedback, and practising peer- and self-assessment strategies (Wiliam & Thompson, 2007).

However, many teachers are still unable to fully integrate AfL strategies into their day-to-day classroom practices. This is because the assessment process itself can invoke “strong emotions of anxiety, irritation and even despair” for both teachers and students (Steinberg, 2008; p. 42). Thus, it is difficult to integrate AfL strategies because teachers need to gain both, knowledge and skills, to create a student-centred assessment or AfL (Black & Wiliam, 2003; Schneider & Randel, 2010). To do so, teachers would need to relinquish their role as the transmitter of knowledge to a facilitator as teachers encourage and engage students to take ownership and active involvement in their own learning. This seems to be one of the most difficult challenges for teachers because they are still comfortable with the hierarchical teacher-student relationship (Marshall & Drummond, 2006; Willis, 2010). Often, teachers who are comfortable with these hierarchical teacher-student relationships are teachers who are not interested to probe for clarification or to get to know their students’ learning progression. They do not like their students to challenge them and to avoid these situations; the teachers give students little opportunity as possible to challenge them. In order to do so, teachers use most of the classroom discussions time to explain the questions and answers. When teachers do this, the teachers relinquish student autonomy in their learning process which is the heart of AfL (Swaffield, 2011).

In addition, teachers would also need to create social and emotional learning environments in order to be successful in implementing AfL strategies (Heritage 2013). When teachers establish social and emotional learning environments, these teachers are actually creating a safe learning environment for their students to learn in where mistakes are considered part of the learning process and not as failures. These teachers also help students to develop sustainable positive relationships with their teachers and peers. Creating a social and emotional learning environment is not easy because not only should teachers focus on the cognitive enhancement of their students but they now need to incorporate social competencies such as to be empathic, able to cooperate and work in

teams as well as developing trust among peers into the assessment process (CASEL, 2013; Taylor & Parsons, 2011; Willis, 2010).

According to Willis (2011) there is a deficiency in AfL literature on how teachers establish and sustain these social and emotional learning environments. These social and emotional learning environments are important in the implementation of AfL because students who are constantly exposed to these types of environment, are able to take ownership and control on their learning and at the same time improve their cognitive competencies (Haertal, Moss, Pullin & Gee, 2008; Willis, 2010).

Allowing activate participation of students in their learning, developing warm and sustainable relationships and the ability to detect and respond to individual needs have shown to be a significantly important factor in learning (Pianta, Belsky, Vandergrift, Houts & Morrison, 2008). Since AfL is associated with enhancement of learning, in the context of this study, we investigated how teachers created social and emotional learning environment as they embed AfL strategies into their science lessons.

THE CONTEXT OF THE STUDY

In Malaysia, there was a move to decentralise external public examinations with the introduction of school-based assessment. The school-based assessment system known as *Pentaksiran Berasaskan Sekolah* (PBS) was introduced in stages, Year 1 in 2011 and Year 7 in 2012. PBS was portrayed as classroom assessments that are continuous and formative in nature with an overarching principle of AfL. PBS was introduced because there is sufficient literature to show the drawbacks of the external public examinations, such as, teachers tend to teach to the test and students predominantly learn through rote memorization (Berry, 2011). The present paper describes part of a larger study conducted in 2014 known as IMCEP (Inquiry into Malaysian Classroom Educational Practices) where we were interested to see how teachers created social and emotional learning environments and how it enhances or inhibits teachers' implementation AfL strategies.

METHODOLOGY

In the original study, 24 Malaysian secondary public schools were randomly selected. Once the school was selected, the research team entered the school and all Year 7 teachers teaching the four core subjects (Mathematics, Science, Bahasa Malaysia and English language) were invited to participate. One hundred and fifty three teachers agreed to participate were observed for three lessons of their choice via video recordings.

In the larger study, teachers' AfL practices were analysed using a self-developed AfL coding framework. The coding framework or rubric was based on several prominent works on AfL and teacher evaluation studies (Black & Wiliam, 2009; Heritage, 2013; Wiliam, 2009; Wylie, Lyon & Mavronikolas, 2009). The rubric contained six dimensions with regards to

AfL strategies. The six dimensions were 'sharing learning target', 'recognizing success criteria', 'Assessing student thinking', 'descriptive feedback', 'self- and peer- assessment' and 'flexibility and responsiveness to assessment'. For each of the dimension, a four-level performance rating (*unsatisfactory*, *basic*, *proficient* and *distinguished*) was established. For each level of the dimension, a performance descriptor was composed that clearly described the characteristics of the teachers' AfL practices.

In the original study, two researchers independently reviewed the video recordings. Each lesson from the video recordings is divided in 10-minute segments. Each researcher would start by viewing the first 10-minute segment and then they would rate the level of the teachers' AfL practices for all the six dimensions. They move on to the next 10-minute segment and repeat the process until the lesson is over. Once they have reviewed one lesson, both researchers would individually give a score for the six dimensions each and it is not the average scores of the 10-minutes segments. After that, both researchers would discuss the scores and if there were any divergence, both researchers will discuss until consensus is reached. For further details of the methodological framing please refer to Tee, Samuel, Norjoharudden and Nadarajan (2016). The findings from this analysis showed that the teachers' AfL practices were so askew, that majority of the teachers' AfL practices were situated at the *basic* and *unsatisfactory* levels. For instance, 92.6 % of the teachers struggled with the implementation of peer- and self-assessment strategies in their classrooms and were rated at *unsatisfactory* level.

Based on these findings, the present study purposively chose two science teachers, Tharini and Aishah, (pseudo names) based on their performance ratings of their AfL practices. Tharini's overall AfL practices was at the *basic* level. In terms of assessment practices, not many teachers were practising even at the *basic* level; more so in the case of science teachers. Thus, Tharini was considered as one of 'outliers' in terms of AfL practices of science teachers. In contrast, Aishah's AfL practices were rated at *unsatisfactory* level and seem to represent the typical Malaysian science teachers' AfL assessment practices.

The three video recording from both teachers were transcribed. Using a framework that consist of all the six dimensions of AfL practices, the researchers in the present study examined the transcripts and located episodes that seemed to match the dimensions of AfL strategies. These episodes were described descriptively based on student-teacher interactions and the classroom learning environment. For example, both the researchers looked at the video at the beginning of the lessons to see if teachers were 'sharing learning target'. The video recordings showed that both teachers did not explicitly discuss the learning target with their students but simply stated what the students will be learning for that lesson. The differences between both teachers were that Tharini began her lesson with a smile and asked her students if they were ready to study. In contrast, Aishah expressed her annoyance when some of her students came in late and began the lesson with a foul mood. The analysis was peer-

reviewed and when there were any variations in opinions, the matter was discussed until consensus was reached.

FINDINGS

Asking questions: (Un)interested in finding out students' thinking

Aishah began her lesson by asking her students some questions on density and what they had learned from their previous lesson. When she did this, her students remained silent and sat passively with their heads facing down. When her students did not respond to her question, she asked her students a more close-ended question to elicit the definition of density from her students.

Aishah : Objects with low density are the objects that will sink or float?

Ss : Float

Once she got the expected answer from her students on this close-ended question (the answer was either float or sink), she simply continued her lesson by asking her students what factors could influence density. Again, no student responded to her question. Aishah looked around the classroom rather furiously until a student answered meekly.

Aishah : What is that? *(Simultaneously cupping her hand to her ear)*

S : Inaudible *(Student said something about compressibility)*

Aishah drops her head and bangs her hand to her head, a gesture to show disappointment.

Aishah : Others please take some Clorox and wash your brains! *(Using a louder tone of voice and showing frustration)*

When Tharini was about to start her lesson, a student reminded Tharini about the previous day homework that she had given them and Tharini smiled and said 'oh whoa...' *(showing she was pleased that her students reminded her)*. Tharini had asked her students to find out if rock was renewable or not. Many of her students were eager to give their answers. Tharini smiled and put her finger to her lips *(telling them to be patient)*.

Tharini: Wait, wait who found out about the rock. *(Many students put up their hands)*. I want to know how you found out...from which website.

S1 : I asked my brother-in-law.

S2 : Teacher I found it at WikiAnswer.

Tharini: Oh, WikiAnswer. Ok, wait. Do you all remember the question? Is a rock...is it renewable or not? Turn around so your friends can hear you. *(Speaking to S2)*

S2 : Rock is renewable but takes a long period of time to renew. Rock cannot be renewed in a short period of time.

Tharini: Can you all hear that? Ok, his answer which is WikiAnswer says that rock is renewable but it takes a long time to be renewed (*showing gesture with arms spread out wide*). Ok one answer, thank you.

Similarly, she receives answers from other students and repeated them so that other students can hear what their friends had found out.

Aishah's AfL practices on asking high quality questions were not successful. The questions were asked superficially as Aishah seemed more interested in eliciting the right answers from her students instead of getting to know their understanding of the lesson. Though Aishah asked her students questions, she did not seem interested or compelled to help them to overcome their difficulties even though there were clear indications that her students did not understand the topic well.

Tharini provided her students with an open-ended question and she allowed her students to take responsibility for their own learning as they explored and found out the information by themselves. Tharini's classroom environment was warm and friendly and students felt safe to give their answers as many of them were willing to answer by putting up their hands eagerly. Tharini's students felt valued because Tharini listened to them and repeated their answers, showing them that she was paying attention to their thoughts and ideas. She also made a point to get her students to speak to their friends, modelling some cooperative learning strategies among her students.

Providing Feedback: Hostile/Friendly manner

Aishah's AfL practices on oral feedback seems to be evaluative in nature where when students could not answer the question, she seem to belittle the student. For example, when a student answered one of the questions wrongly, Aishah repeated the wrong answer a few times but with a louder tone.

Aishah : point five? point five? POINT FIVE? Please read the question well. Others what is the answer? *Other students answer.* Yes, 5.5. Your answer after this will be problematic, ok? (*Informing the student*).

Similarly, when Aishah asked her student to explain how she arrived at her answer and when the student could not justify how she got the answer; it did not compel Aishah to probe further to gain insights of the students' difficulties in the learning process. Aishah simply provided her with the answer and clearly this action will not move the student learning forward.

Aishah: 1.2, yes. How did you get this answer?
(*Student is silent*)

Aishah : Mass over volume.

In contrast, Tharini provided feedback that explained and incorporated answers from her students. After receiving answers such as '*teacher it is non-renewable but I don't know why*', '*rock is a geothermal energy and it is renewable*', and '*renewable*', she asked the students if they want to know the answer.

Tharini: It's both - renewable and non-renewable. *Tharini smiles and some of her students smile and laugh.*

Tharini: ...It's also non-renewable because like Ryan said just now, it takes a long time, a super long, a super, duper, super, duper, luper long time for it to be renewed. (*Putting hands apart to imply a long period of time*). Does that make sense to you?... And if you ask me I will go with non-renewable because...

Tharini provided examples from her students' answers to summarize what had been discussed.

Aishah's AfL feedback practices were evaluative in nature as Aishah did not attempt to show her students where they had gone wrong and how they may move on with their learning. Her current feedback practices did not give her students the chance to enhance their learning and these students are likely to resort to rote memorization. The classroom atmosphere was very impersonal as the teacher stood in front of the classroom most of the time and the pace of the lesson was suited more for the teacher rather than the students.

The scenario was different for Tharini's class. When students provide her with their answers, Tharini acknowledged what all her students had said and did so in a non-evaluative manner. Her focus on providing feedback was not only on students getting the right answer but to value what each student had said. Tharini had instil a non-hierarchical relationship with her students when she showed them that her opinion was just like any one of theirs when she said '*if you ask me I will go with non-renewable*' and did not impose her ideas onto her students.

Peer-Assessment: Discouraged/Encouraged

In one of the lesson, Aishah was asking her students a question when she noticed that one of her students was talking to his friend regarding the question. She pointed to that student and told him that the next question will be for him. Aishah did not encourage peer talk in her lessons and looked upon peer talk as a 'crime' and students who do talk during lessons will be punished.

On the other hand, Tharini asked her students to work in groups to create a short story to show their understanding of the concept of heat. She then made them share their ideas with the class. One pair shared the following example.

Tharini: Ok. You can hear this. This is really funny. Let's turn behind (*So the girls can face their friends*). Ok, so listen to this.

S1 : A guy in WWE and Sugan (*their classmate*). A normal person comes and hugs both of them; the guy who hugs the WWE person will have more heat. ... Like he is bigger. (*Students were laughing*)

Tharini: (*Smiling*) Her point is, bigger people have more heat. We should do this experiment (*Playfully*)

As seen in Tharini's class, the learning environment was safe as students trust each other and were willing to use their friend's name (Sugan) in their example. Students were laughing and were involved the classroom discourse. Tharini up-took her students' interest in learning and did not belittle or scold them when they provided examples that could be considered as bad-mannered by some teachers.

Though there was no clear evidence of peer-assessment, Tharini had initiated ideas of peer-assessment when she asked her students to listen to their friends' story and to see if the story was funny and interesting. By allowing her students to work in groups, and to create their own stories, these students would have evaluated the quality of their work before presenting it to their classmates. By allowing her students to actively participate in the classroom, Tharini had turn the learning classroom discourses into more meaningful and folksy conversations that allow students to relate the new learning material with to their own personal experiences. In contrast, Aishah's class had no student-student interactions and no students' voices were heard. Both interactions and students' voices are prerequisite for peer-assessment and are the heartbeat of AfL practices and these components were absent in Aishah's classes.

DISCUSSION AND CONCLUSION

The findings of this study did show that Tharini was more successful than Aishah in implementing AfL strategies. However, it should be acknowledged that Tharini is still not practicing authentic AfL practices because she did not show evidence of explicitly sharing the learning target with her students or even when she made effort to allow students to share their ideas but she did not allow her students to evaluate their peers' work. For example, she decided which students' example was funny. Moreover, she did not involve other students and ask them how it was related to the content matter or how they may improve the story to make it more relevant to the topic under discussion. That was why in the original study, Tharini was placed in the 'Basic' level.

There is evidence that Tharini's practices are more successful than Aishah's because she made effort to create learning opportunities where students took responsibility for their own learning and she did not

constantly spoon-fed her students with information (Sach, 2012). Moreover, Tharini also created a sense of belonging through her calm and witty approach during her lessons, inducing humour and making the class a safe place for her students to experiment with new and innovative ideas (Willis, 2010). Tharini had at instances during her lessons, inspired her students to heed to their peers' thoughts and ideas and encouraged team work, cooperation and trust among her students (CASEL, 2013; Taylor & Parsons, 2011). Thus, by creating a more social and emotional learning environment Tharini was able to exhibit more success in the AfL implementation. In contrast, Aishah is still very comfortable with the hierarchical teacher-student relationship (Marshall & Drummond, 2006). These hierarchical teacher-student relationships do not allow students to receive feedback that can move their learning forward and do not allow them to take responsibility for their own learning; these two actions are antithesis to AfL principles (Hattie & Timperley, 2007; Heritage, 2013).

Since, AfL implementation demands and creates a "set of very complex and tricky practices for both teacher and learner" there is a need to educate teachers not only on the strategies of AfL but also on the creation of social and emotional learning environments to boost the positive effects of AfL (Proyor & Crossouard, 2008; p.6). In line with this, teacher education and teacher development programmes should help pre- and in-service teachers to create and marry AfL strategies with content matter and at the same to create classroom cultures that are socially and emotionally conducive. Helping teachers develop positive learning relationships with their students and engaging students to being actively involved in their learning (Willis, 2011) could lead to be implementation of AfL strategies and may be the pathway that leads to the success of school-based assessment that many educational systems inspire to achieve.

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